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# FOREST RESEARCH NEWS

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## FOR THE MIDSOUTH

SOUTHERN FOREST EXPERIMENT STATION, FOREST SERVICE, U. S. DEPARTMENT OF AGRICULTURE

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### ALABAMA SHOWS TREND TO AVOID TREE WASTE

How much wood will be available in the future depends in part on how completely trees are put to use when they are cut.

True, a lot of waste is created during milling. But most of it is now turned into valuable by-products. Thus, large quantities of chips, slabs, and edgings go to pulpmills for paper.

But logging wastes—those created when the trees are cut—are seldom used. Logging residues are scattered, unwieldy, and unprofitable to transport. So they are often wasted.

How much material actually is left behind when a tree is cut in a typical southern logging operation? How has the recent trend

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### AERIAL SEEDER WINS AWARD

An aerial row seeder developed at Auburn University in cooperation with the Southern Forest Experiment Station has been cited as one of the 100 most significant new technical products designed during the past year.

With the device, approximately 9,000 pine seeds per minute can be planted from a helicopter or airplane. In contrast, an experienced planter working long hours would do well to plant 2,000 seedlings in a day.

The award was presented in Chicago by INDUSTRIAL RESEARCH magazine to Dr. M. A. Cutchins, associate professor of aerospace engineering at Auburn, who designed the seeder

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*Large quantities of milling residues, such as chips, are turned into valuable by-products.*



Yaupon (*Ilex vomitoria*)

### FOR THE BIRDS

Because plant fruits are food for wild birds and animals, land and wildlife managers need to know when various plants bear fruit, how much they yield, and which ones will grow best and produce fruit in the shade.

The flowering and fruiting habits of 14 common species of woody vines, shrubs, and small trees in southern forests were observed for 9 years by Southern Forest Experiment Station researcher Lowell K. Halls. The findings were recorded and are available in a new Station publication.

Beginning in 1963, a stand of shortleaf and loblolly pines on the Stephen F. Austin Experimental Forest near Nacogdoches,

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toward mechanized logging affected tree utilization? Two Southern Forest Experiment Station researchers—Roy C. Beltz and Thomas W. Chappell—set out to find some of the answers.

They observed logging throughout Alabama during 1972. They found the most efficient operations, those for softwood veneer and pulpwood, left 10 percent of the volume in the woods. Most of this was in stumps and crown portions. The time consumed in cutting the many small branches off the upper portion of the stem makes it uneconomical to use that part of the top, though Chappell believes use of the fiber in these tops will become feasible in the future.

Residue volume rose to about 17 percent for softwood saw-logging, where considerable wood is lost in defective bole sections. Hardwoods ranked the highest in logging waste. Chappell explains that hardwood saw logs must be reasonably straight if they are to yield good lumber. Therefore, tree trunks with "crook" or "sweep" are rejected.

Damage to tree boles by insects and disease accounts for some of the waste. The researchers recommend that industries explore possibilities for processing poorly formed, low-quality trees. And they urge that moves be made to use more of the top portions of the tree and to leave less stump.

By comparison with a regional study of 1964, the Alabama results indicate a trend toward fuller use of forest trees. The proportion of inventory volume wasted has declined about 50 percent for both hardwood and softwood saw logs and for hard-



*Logging residues are scattered, unwieldy, and unprofitable to transport.*

wood pulpwood.

Details of the Beltz-Chappell study are reported in an article entitled "Trends in Product Logging and Tree Utilization in Alabama" in the August 1973 issue of the FOREST PRODUCTS JOURNAL. Reprints are available on request from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.

## **Atlas Has Information For Southern Hunters**

How many deer hunters looking for their buck wonder in just what counties are the most deer killed?

How many hunters out for doves wonder where populations are thickest—and if they are on the upswing or going down?

And how many landowners wanting to encourage bobwhite quail wonder what they can plant or leave along the fencerow to

encourage nesting? And what are the best food plants for quail?

Hikers in the woods may wonder if they're seeing more or fewer squirrels these days. Any chance of finding wild turkeys down your way?

An "Atlas of Southern Forest Game," published by the Southern Forest Experiment Station, answers these queries and more. The 24-page booklet presents information about distribution of important game animals that find their food and cover in the 200 million acres of southern forests. It shows trends in populations, where game kills are highest, and locations of public hunting areas. It describes habitat requirements and possible habitat improvements for various species, including some migratory birds that winter in the South.

Copies are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.



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Texas, was thinned, and vegetation under the trees was cut or killed with chemicals. One-year-old seedlings of 14 species were planted. Similar plantings were made in a nearby field, where weeds were controlled until the study plants became established.

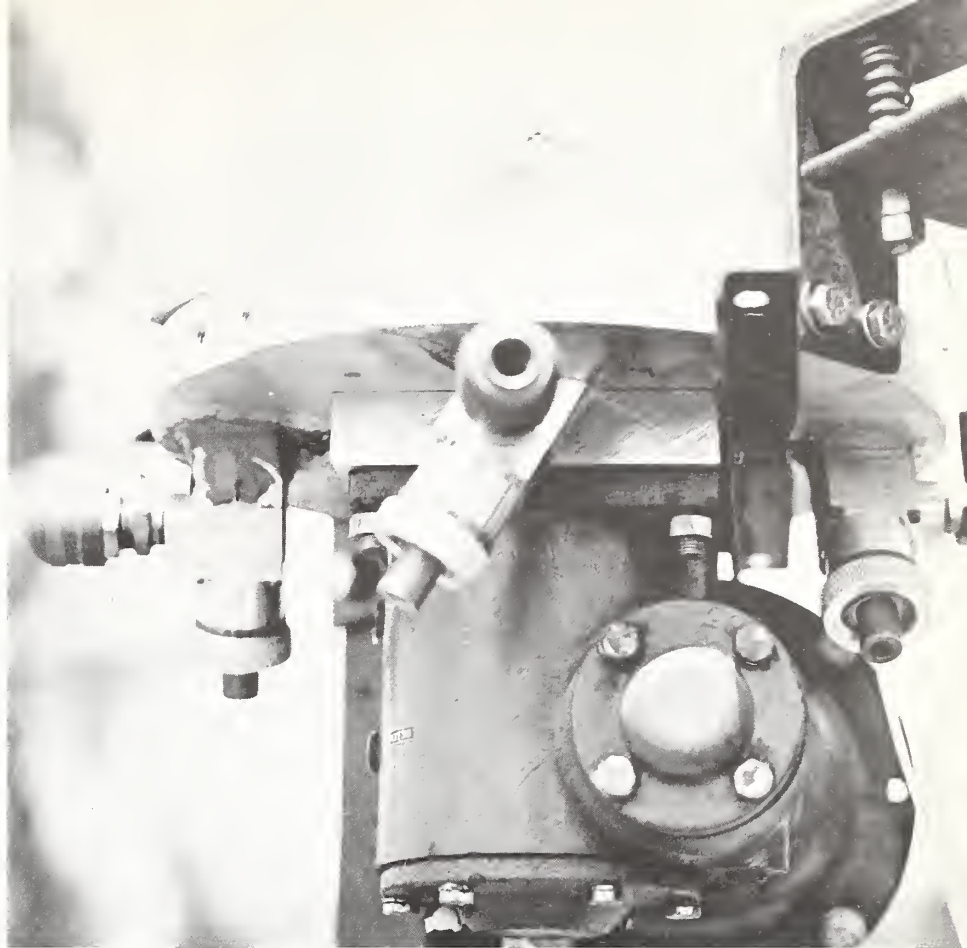
While flowering dates for most species were not consistently influenced by tree shade, Halls found that American beautyberry flowered earlier in the open. Flowering dogwood, sassafras, and common greenbrier flowered earlier beneath trees.

Flowers on almost all species bloomed earliest in the years when March temperatures were highest. January and February temperatures had no obvious effect on the appearance of flowers, nor did the amount of rain. In a typical year species bloomed in the following order: (1) flowering dogwood and sassafras, (2) rusty blackhaw, red mulberry, and smallflower pawpaw, (3) yaupon and common greenbrier, (4) saw greenbrier, dwarf live oak, Japanese honeysuckle, and Alabama supplejack, (5) sweetbay magnolia and muscadine grape, and (6) American beautyberry.

Whether planted in the open or under trees, American beautyberry first produced fruit when 2 years old. All other species except red mulberry produced mature fruit at an earlier age in the open than beneath trees. In the open, sweetbay magnolia and common greenbrier bore fruit at age 6, and most other species at 3 or 4 years. Beneath trees, the beginning fruit-bearing age ranged from 5 to 9 years. Sweetbay magnolia, dwarf live oak, saw greenbrier, rusty black-

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*A mounted model of the prize-winning aerial seeder shows the three nozzles, each of which sends 3,000 pine seeds per minute to the ground. In the bin above the nozzles, pine seeds pelleted in water-soluble clay roll over a fixed metal cone to a rotating plate that guides them over the inlet to the nozzles.*

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under a research grant sponsored by the USDA Forest Service and the Southern Station.

An advisory board of INDUSTRIAL RESEARCH selected the winning products for their importance, uniqueness, and usefulness from a technical standpoint. On the board are Wernher von Braun and more than 20 other distinguished scientists.

The prize-winning device is about the size of a large ice cream freezer or a small pump. It weighs about 70 pounds. Under a compressed air scheme, about 3,000 pine seeds per min-

ute pass through each of three nozzles to the ground. The seeds are coated with water-soluble clay to make uniform pellets for firing through the nozzles. The high rate of seed dispensing is dictated by flight speed, the desired spacing along the row—approximately 12 inches—and the number of rows to be sown on any one run. The present design has three.

Field operation tests are planned for this winter. While the seeder is presently limited to southern pine, researchers foresee other applications, such as planting soybeans and other row crops.



## *Better to Seed or Plant Pines?*

Where a stand of southern pines is being harvested, should seed trees be left to provide for natural regeneration? Is it better to plant nursery-grown seedlings? Or would seeding by artificial methods be preferable?

Southern Forest Experiment Station researchers Thomas E. Campbell and William F. Mann, Jr., have recently published results of studies designed to help answer these questions.

Beginning in 1960, the Forest Service scientists set up 14 study areas representing a wide range in climate, site, and soil conditions in Louisiana and east Texas. Comparisons were made in some cases between growth from natural seeding and from direct seeding—scattering the seed directly on the ground where the trees are to grow.

On other areas the two seeding methods were compared with regeneration from planted seedlings. The height of each seedling, and the number of seedlings per acre, were measured when the trees were 1, 2, and 3 years old.

The greatest shortcoming of natural seeding was failure to get adequate stocking in the first year. Sometimes two or three seed crops were needed, and the delays gave brush an advantage over the young pines. Even with the delays, however, natural regeneration proved to be more successful than is generally recognized in the West Gulf Coastal Plain.

Direct seeding was also successful. It is preferable to natural regeneration because it lets land managers adjust sowing rates to circumstances and land requirements. Sowing can be timed to minimize seed exposure to predators and bad weather, to assure ample soil moisture for rapid germination, and to allow time to prepare the site. Depending on seed trees allows no such controls. In the 14 direct seeding tests, only one failure could be attributed to the method.

Planting nursery seedlings proved the most reliable technique, and most landowners prefer it when feasible. But planting is often too slow to allow completion of a job in the allotted time. And it is expensive. Also, planting is sometimes impossible when the terrain is too rough or the sites too wet for travel by men and machines.

*A heavy wildland disk left this site in excellent condition for seeding, but rough for planting by machine.*





The research showed that loblolly pine can be successfully regenerated by all three methods. But it is unwise to make snap decisions on which is best. Among other things, the landowner must consider probable weather conditions, site conditions, acreage to be forested, availability of labor, and economic factors, including the premium of speed in getting a new stand of trees established.

Copies of a publication giving details of Campbell's and Mann's tests are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113. Ask for "Regenerating Loblolly Pine by Direct Seeding, Natural Seeding, and Planting," Research Paper SO-84.

*After a poor burn, hardwoods sprouted vigorously and overtopped young pines.*



*Three-year-old slash pine planted on a disked site. Disking retarded hardwood incursion.*



*Three-year-old stand of direct-seeded loblolly pine.*





# Pulpwood Production Reaches New High

Pulpwood production in 12 Southern States climbed to a record high of 44,279,487 cords in 1972, a 6-percent increase over last year. Of 124 mills processing southern pulpwood, 109 were in the South. Pulping capacity of the southern mills rose 1 percent to 88,124 tons per day. Roundwood output and residue use expanded in both softwoods and hardwoods for a total gain of 2,365,671 cords.

These findings are reported in "Southern Pulpwood Production, 1972," by Daniel F. Bertelson, USDA Forest Service. The report is published jointly by the Southern and Southeastern Forest Experiment Stations at New Orleans, Louisiana, and Asheville, North Carolina. The Southeastern and Southwestern Divisions of the American Pulpwood Association cooperated in gathering the data.

Through the 1960's southern pulpwood harvests averaged a 6-percent increase each year. In 1970 the rise was 3 percent, and in 1971 there was a slight decline. The 6-percent increase in 1972 marks a return to the pace set in the sixties.

Georgia remained the region's top producer of pulpwood, with 7.6 million cords. Alabama was second with just under 7 million cords, and Mississippi remained third with 4.6 million cords. Georgia and Alabama accounted for one-third of the South's total. While Oklahoma accounted for only 1 percent of the southern total, its output more than doubled during the year.

Roundwood harvest in 1972 increased 5 percent, with eight Southern States showing gains. Softwood roundwood rose by 3 percent, while hardwood increased 12 percent. Alabama was the leader in volume, with a gain of 600,000 cords. Five States recorded an increase in both softwood and hardwood output. Only Tennessee was down in both categories.

Roundwood species changed very little as softwoods decreased slightly to just under three-fourths of the total production. The hardwood volume was made up of 42 percent oaks, 31 percent gums, and 27 percent other hardwoods.

Sixty-eight counties produced at least 100,000



*Of 124 mills processing southern pulpwood, 109 were located in the South.*

cords of roundwood in 1972. Alabama alone had 18 such counties, while 11 parishes in Louisiana exceeded the mark. Choctaw County in Alabama, a top producer in the past, was again the leader with 279,470 cords. McCurtain County, Oklahoma, a newcomer to the ranks of top roundwood producers, was second, followed by Sabine and Vernon Parishes in Louisiana.

The use of plant byproducts increased in 1971 by some 749,000 cords, or 7 percent over the previous year. Softwood residue rose 9 percent while hardwoods gained 2 percent. More than 81 percent of the residues were softwood, and more than 93 percent were received at the mill in the form of chips. Residues accounted for just under one-fourth of total pulpwood receipts, a slight increase over the 1971 ratio.

Special features in this year's reports are colored maps showing the amount of roundwood produced and the number of firms procuring wood in each county.

Copies of the new publication, Resource Bulletin SO-41, are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113, and from the Southeastern Forest Experiment Station, P. O. Box 2570, Asheville, North Carolina 28802.



## Action Council Forms To Battle Bark Beetle

A Southern Pine Beetle Action Council has been formed following a south-wide meeting of forestry and conservation interests in Atlanta.

The Council will provide leadership and continuity in a broad-based effort to control the destructive insect whose attack has reached epidemic proportions on 60 million acres of pine forests in 10 Southern States from Virginia to Texas. Representatives of State and Federal agencies, forest industry, universities, wildlife and conservation groups, news media, and the general public are being asked to take part. Chairman of the Action Council is R. Rodney Foil, Dean of the School of Forest Resources, Mississippi State University.

Dr. Foil said the goal of the Action Council will be to "encourage development of ecologically sound, operationally feasible, environmentally acceptable techniques and strategies to minimize impacts of this insect."

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Vandalism in the National forests of Oregon and Washington decreased almost 10 percent in 1971.

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## Beaver: Alabama Timber Trespasser

Thirty years ago fur trappers nearly eliminated the beaver from Alabama. Today the animals are so plentiful that there is growing concern about the extent of beaver-caused timber damage.

In 1971 Alabama beavers killed 728,000 cubic feet of merchantable timber, accounting for only 1 percent of the State's total timber mortality. An additional 93.3 million cubic feet—less than 0.5 percent of the current timber inventory—show signs of beaver damage.

These data were discovered during the Southern Forest Experiment Station's 1972 forest survey of Alabama and reported by scientist Arnold Hedlund in a recent issue of ALABAMA FOREST PRODUCTS.

Hedlund found that most of the beaver-caused timber losses occurred in the west-central region of the State, where land is level to gently rolling and laced with slow moving, minor streams. In the more mountainous areas to the north, beaver damage is slight. Here water is more plentiful, and beavers need not build dams.

Beaver populations can be best controlled by professional trapping, Hedlund notes. Water levels in beaver ponds can be lowered by installing perforated pipe or a log culvert in the dam. However, Hedlund suggests that controls be applied cautiously since these ponds aid in soil and water conservation. Beaver ponds can also provide habitat for ducks, gamefish, and other wildlife.

Copies of Hedlund's "Beaver: Alabama Timber Trespasser" are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113.



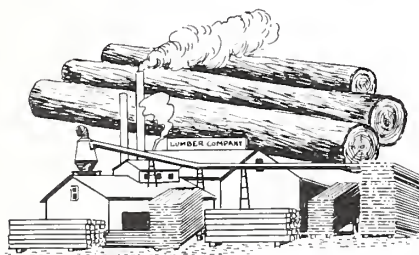
# Arkansas Wood Industries Up In Size, Down In Number

Arkansas forests supplied more than 451 million cubic feet of roundwood to forest industries in 1971, with softwoods—mainly pine—making up more than two-thirds of the total.

The timber harvest increased 15 percent from 1969-1971, while the number of primary wood-using plants decreased. A total of 499 wood-using plants were in operation during 1971. Some small sawmills have been shutting down, and larger mills are increasing their output. Pulp-mills have been expanding their capacities, and development of pine veneer plants has more than offset a declining hardwood veneer industry.

Saw logs and pulpwood comprised 83 percent of the roundwood harvest. Veneer logs made up over 9 percent, with more than half the remainder going into poles and charcoal wood.

In manufacturing roundwood into lumber and veneer, Arkansas mills generated 170 million cubic feet of wood residues in 1971. They converted 79 percent of that amount into plant byproducts—mainly pulp chips. Both residue volume and the portion used have been increasing. The unused 35 million cubic feet was mostly fine particles with no present market. A major need exists to find ways to use bark.



These are among the findings of a canvass of all primary forest industries in Arkansas. Data collected by the Arkansas Forestry Commission were compiled and analyzed by the Forest Resources Research Unit of the Southern Forest Experiment Station in New Orleans and published in a report titled "Arkansas Forest Industries, 1971." The report tabulates total State production and shows softwood and hardwood output by county. It lists primary forest industries and maps plant locations.

Copies are available on request from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113. Ask for Resource Bulletin SO-38.

## BOOK TELLS HOW TO PREVENT DECAY

How to protect wood buildings from decay is the subject of a new USDA Forest Service booklet. In 56 well-illustrated pages two primary means are emphasized. One is using dry wood and construction methods to keep wood dry. The second is using preservatively treated wood in areas where dry conditions cannot be maintained.

The book is based on more than 40 years of observation and research by government agencies. Copies are available on request from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113. Ask for "Principles for Protecting Wood Buildings from Decay," USDA Forest Service Research Paper FPL-190.



*Alabama supplejack*  
(*Berchemia scandens*)

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haw, and muscadine grape planted beneath trees did not bear fruit during the entire 9-year study.

Red mulberry was the only species that bore fruit in the spring—May. American beautyberry yielded more fruit than any other species. Yaupon had the second highest yield per plant, but the proportion of total plants bearing fruit was relatively small. Red mulberry plants beneath trees became infested with white peach scale in 1968 and 1969, and by 1971 all plants had died.

Rusty blackhaw produced only small amounts of fruit through 1971, but a large increase in 1972 indicated that the species was just beginning to reach its potential.

Details of Halls' study and findings for the 14 species are available from the Southern Forest Experiment Station, 701 Loyola Avenue, New Orleans, Louisiana 70113. Ask for "Flowering and Fruiting of Southern Browse Species," Research Paper SO-90.